Zeller Consulting Suisse
Dipl.-Ing. Marin Zeller, TU, VDI
Jurastrasse 35
CH-3063 Ittigen

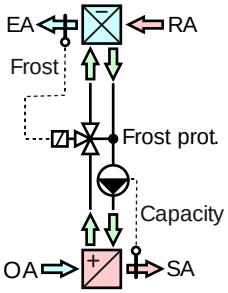
www.zcs.ch
info@zcs.ch
+41 (0)79 222 66 42

# Frost!

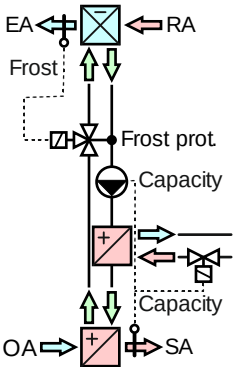
## Protection against frost damage in CC-Systems

Connoisseurs of the matter put a frost sensor in the exhaust air outlet, which only reacts in frost, which is not the case, for example, when the exhaust air is sometimes very cold but dry. You do not want to give away heat recovery energy, just when you need it most. As a frost sensor you can, for example, combine a temperature sensor with a wet sensor or use a photocell that responds to frosted white fins, causing the fins in the vicinity of the photocell to be painted black. The pump is arranged so that the supply air always receives the full amount of intermediate carrier. This ensures that additional energy can be supplied via the plate heat exchanger. The exhaust air receives a reduced amount of intermediate carrier, which reduces the power from the exhaust air and prevents freezing.

**CCSB Split**

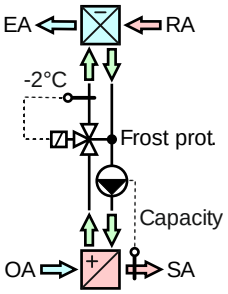


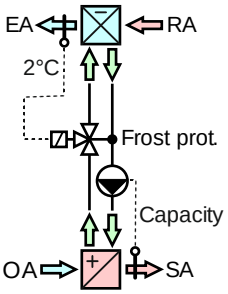

**CCSD Split**




Stupid people put a temperature sensor in the intermediate circuit, which reacts to -2°C, for example, and then give energy when they need it most. Temperature sensors in the intermediate circuit are just cheap.

Other stupide people put a temperature sensor into the exhaust air outlet, which reacts to +2°C, for example, and give away energy when it is most needed. Even temperature sensors in the exhaust outlet are cheap.




However, even the biggest stupide people choose the wrong position for the pump and thus prevent additional energy being required via the plate heat exchanger.

**Teacher Plämpel from Wilhelm Busch sends a professorial salute.**